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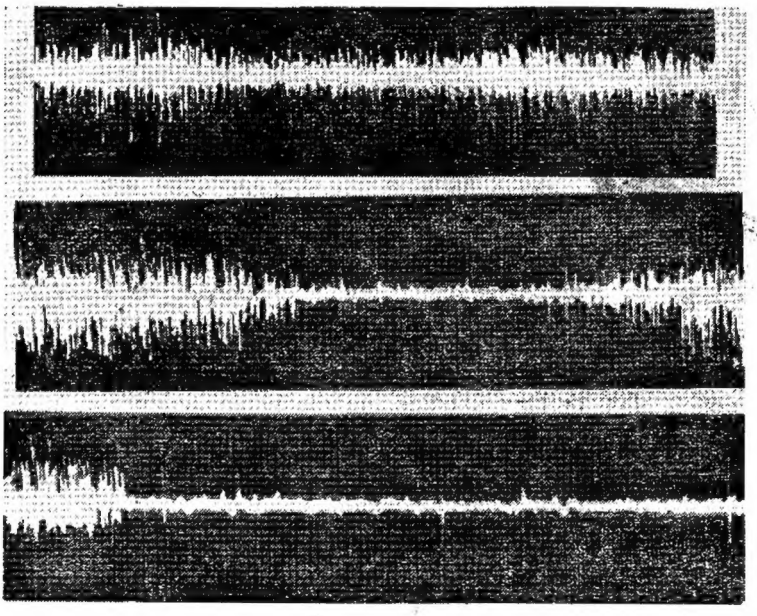

Temporary and permanent breakdown in nerve impulses of Desert Locust due to DDT poisoning

(Please see the article on page 69)

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Use of distantly-related natural enemies is more effective than the closely-related ones in the integrated control of pests.

Electrophysiology as a Tool in Entomological Research

Among the recent techniques in biological research electrophysiology offers an unique approach to the study of the physiology of animals with particular reference to the electrical activities of various body systems. In entomological research, only a few laboratories in the world have been able to make adequate provision for adequate exploitation of electrophysiological techniques Considerable progress has been made in the field of neurophysiology and such principles of neurophysiology have been further utilized in the neurotoxicological investigations. Since most of the insecticides which are in use nowadays are neurotoxins and none of these toxicants is fully understood as regards its exact biological activity, electroneurotoxicological investigations are very useful to understand the mode of action of insecticides. This understanding ultimately opens new vista for the search of newer insecticides.

In the beginning of sixties an electrophysiological laboratory was established with collaboration of the Division of Agricultural Physics. The equipment were procured from the Grass Medical Instrument Co. Mass (U.S.A.) and set up in the Division of Entomology, Indian Agricultural Research Institute, New Delhi. A screening case has been very suitably devised to house the entire set up in order to obtain very precise data on electroneurophysiology. With the help of this set up it has been possible to register and record the nerve impulses of insects in the form of electric potentials, the pattern and magnitude of which can be understood with the height of the vertical lines of the figure.

Preliminary studies on the mode of action of insecticides were initiated and on the basis of data collected on the effect of DDT on the electrical impulses of the Desert Locust, *Schistocerca gregaria* Forskal, a number of interesting conclusions were arrived at leading to the formulation of 'a new physical theory of the mode of action of DDT' from a new angle not visualised before (Pradhan and Rangarao, 1966).* It has been observed that the frequencies of the spontaneous impulses in the crural nerve are higher in insects pretreated with DDT at lower temperature and then gradually brought

* Pradhan, S. and Rangarao, P.V. 1966. A new physical theory of the mode of action of DDT. *Experientia*, 22 : 619—621.

to the medium temperature than in insects pretreated at higher temperature and then gradually brought to the same medium temperature. Also reversible blocks were recorded at lower temperature in the spontaneous activity of the crural nerve of the insects treated with DDT. This has led to the surmise that the negative temperature coefficient of DDT action may be due probably to an interference in the mechanism of ionic transport across the neuron membrane responsible for the formation of the spike potential.

Attempts were further made to explore the quantitative effects of different insecticides on the electrical activity of the nervous system of the Desert Locust under controlled conditions. The sensory and motor part of the nervous system were prepared and the effects of the insecticides were ascertained on the afferent and efferent impulses in order to pin point the specific loci of actions.

On the whole, it has been possible to demonstrate that *the neurons responsible for afferent impulses are quite different from those responsible for efferent impulses so far as their susceptibility to insecticide is concerned, and also the neurons responsible for efferent impulses belong to more than one group with respect to their susceptibility to dieldrin.*

Thus this facility provides an unique opportunity in entomological research and the fellow workers throughout the country are welcome to make use of this facility.

K.M. Singh

Donations to the National Pusa Collection

The following are some of the species of Thysanoptera (Thrips) received as donation to the National Pusa Collection from Dr. T.N. Ananthakrishnan of Loyola College, Madras, during the year.

Aeolothrips distinctus Bhatti
Agriothrips brevisetosus Ananthakrishnan
Alocothrips hadrocerus (Karny)
Amphithrips argutus Ananthakrishnan
Anaphothrips sudanensis Trybom
Anascirtothrips arorai Bhatti
Androthrips coimbatorensis Ramakrishna
Androthrips flavipes Schmutz
Arrhenothrips dhumrapaksha Ramakrishna
Arrhenothrips ramakrishnae Hood

Astrothrips parvilimbus Stannard & Mitri
Austrothrips cochinchinensis Karny
Azaleothrips amabilis Ananthakrishnan
Ayyaria chaetophora Karny
Bactriodothrips idolomorphus Karny
Bathrips jasminae Ananthakrishnan
Caliothrips indicus Bagnall
Callothrips ascitus Ananthakrishnan
Carissothrips nigrescens Ananthakrishnan
Cercothrips nigrodentatus (Karny)
Cercothrips tibialis (Bagnall)
Chaetanaphothrips clarus (Moulton)
Chiraplothrips graminellus Priesner
Chiridothrips indicus Ramakrishna & Margabandhu
Chirothrips mexicanus Crawford

Usha Ramakrishnan

The Paddy Gall Midge, *Pachydiplosis oryzae*, (Wood Mason) Mani in serious form for the first time in Uttar Pradesh

The paddy gall midge which had not so far been reported from Uttar Pradesh has been found occurring in rather a serious form in high-yielding varieties of paddy crop in Gorakhpur and Deoria districts during the months of August-Septemper, 1971. So far one Development Block in Gorakhpur district and six Development Blocks in Deoria district are reported to be affected by this pest. The survey of paddy areas in other eastern districts of this State is in progress and it is suspected that the pest may be more widely distributed than reported so far.

It is obvious that the paddy gall midge is extending its area of spread in the Indian sub-continent and that the northern States have to take a careful note of this new development.

P.L. Chaturvedi*

Avoidable Loss in 'Moong' *Pusa Baisakhi*

In a replicated trial against pests of 'moong' *Phaseolus aureus* two insecticides namely aldicarb and disyston were tried and they

*Entomologist, U.P. Institute of Agricultural Sciences, Kanpur-2.

were applied in separate sets of plots as granules in furrows @ 1.5 kg/ha ; and alongwith these, a set as control (untreated) was kept. Each of these sets of plots were divided into four sub-sets ; one of these was again kept as control and each sub-set received two sprayings 4 and 6 weeks after sowing, with one of the three pesticides namely monocrotophos, lindane and endosulfan. The best treatment was aldicarb alongwith monocrotophos which gave yield of 870 kg/ha as against control where the yield was 27 kg/ha, which means an avoidable loss of 96.8%.

These results highlight the urgent need of suitable pest control for the success of 'moong' *Pusa Baisakhi.*

H.P. Saxena, Amrit Phokela &
Yeshbir Singh

Seed treatment of sorghum for the control of shootfly

Field trials were carried out in 'kharif' 1970 to collect supporting data on the efficacy of carbofuran seed treatment for the control of sorghum shootfly. In one of the trials it was observed that sorghum seeds treated with four parts of carbofuran (A.I.) per hundred parts of seed and stored for four, six and nine months were as effective as freshly treated seeds. The percentage dead hearts in the seedling from stored seeds, 21 days after germination, varied from 5.33 to 12.00 as against 6.00 in freshly treated seeds. The percentage dead hearts in untreated checks were 62.60. The germination of the treated seeds was not impaired during the storage period.

In another trial it was found that 4 and 6 per cent carbofuran (A.I.) seed treatments and 5 per cent granular treatment applied at 1 gm per metre row, were compatible with agrosan seed treatment applied @ 4 gm per kg of seed.

M.G. Jotwani, T.R. Sukhani & Santokh Singh

Resistance to Gundhi Bug

While studying the reaction of 156 rice varieties against the gundhi-bug during 1970 'kharif' season, (obtained from Germplasm of Assam Rice Collection, Genetics Division, I.A.R.I., New Delhi), it was observed that sixteen varieties *viz.*, IARI Nos. 5903B, 5904A, 5908D, 5975A, 5978, 5981B, 5982, 6186, 6188A, 6245, 7226, 10011,

10318, 10351A, 10680, 10697 were least preferred for feeding. While twenty five varieties *viz.*, IARI Nos. 5926, 5928, 5957, 5958, 5972, 5977, 6208, 6213, 6572, 6554, 6565, 10049, 10056, 10068, 10268, 10282, 10291, 10550, 10560, 10563, 10585, 10587, 10699, 10705, 10705C escaped the gundhi-bug infestation as these varieties flowered very late when gundhi-bug population in field had dwindled. Short statured-variety IARI 5932 was most preferred by the gundhi-bug for feeding as well as for oviposition.

G.D. Pimprikar

Hidden infestation in seed material

The quarantine problem posed by seed infesting chalcidoids and bruchids of the genus *Bruchidius* was studied at the Quarantine Laboratory of the Division of Entomology and in order to detect the hidden infestation due to these insects, it was considered necessary to subject all the suspected seeds to X-ray screening immediately on import. For this purpose a list was drawn up comprising of 132 plant genera, the seeds of which have been reported to be infested with such insects. During the six years (1965-70) since this work was started, 1159 seed samples were subjected to X-ray screening and hidden infestation in 148 (or 12.8%) samples was detected. These detections included 110 instances of chalcidoid infestation and 39 instances of bruchid infestation (one sample having both chalcidoids as well as bruchids). Latent infestation was noticed in 16 genera of Leguminosae, 5 of Umbelliferae, 2 each of Rosaceae and Graminae and 1 of Anacardiaceae. In all, seeds of 93 plant genera were screened. Such a high incidence of latent infestation in seeds, which had so far been considered to be free from quarantine risks and were allowed to be imported freely, is alarming and calls for immediate corrective steps.

S.R. Wadhi & B.R. Verma

Indian Editions of Annual Review of Entomology

Under an agreement signed between Annual Review Inc. a non-profit organization in California, USA (publishers of Annual Reviews of Entomology) and Amar Mansingh Shiksha Samiti, a non-profit registered Society at Fatehpur, U.P., reproduction of volumes would be taken up in the following years.

Indian Edition would be an exact replica of the US edition and will be on sale from March, 1972 onwards.

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Mailing list is being revised. Any change or mistake in the address may be intimated to the Editors, Entomologists' Newsletter, Division of Entomology, I.A.R.I., New Delhi-12.

New requests for including the names in the mailing list would now be considered only for 1972.

Editors

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